decided on for channel control on the new system DDM to enable the operator to have immediate access and overriding control with integral mimic display on any channel.

For playback, comprehensive action controls were required which would enable



composite scenes to be prepared as the summation and/or deletion of any number of memories. Two completely separate playback masters were demanded, each with independent up and down fade rates. Copy facilities were to be provided between playbacks, and playback action controls would be such that a lighting director could make immediate demands for the type of fade to be changed, terminated or even reversed, no matter what type of fade was taking place.

In fact the whole concept of DDM, besides giving the operator comprehensive recording and playback controls, is to provide him (or the lighting director) with easy means for modifying the recorded plot to facilitate last-minute changes during rehearsal and to cater for the unpredictable during the show. In technical parlance one might say that DDM has been designed to permit a very high degree of man/machine interaction. However for such a thing to be possible it is essential to have comprehensive mimic facilities in order that the operator can be made constantly aware of the operations and changes which he has made.

From the development point of view, one of the difficult features of such a system is that to define on paper every logical aspect of performance is an almost superhuman task. Faced with this problem and with the difficulties of development along conventional hardware lines, thoughts naturally turned to the incorporation of a digital computer. Memory lighting control systems have in the past often been loosely referred to as "computerised" lighting controls. However, although such systems use electronic circuits similar to those employed in computers, the description is strictly only applicable if the system incorporates a programmable computer. To the best of our knowledge, DDM is the first such equipment to be developed in Europe.

Before looking at the technical aspects in more depth, it is worth examining the human side of the story. The DDM operational concept had been originated by Frederick Bentham and was realised in a very simplified 16-channel pilot project. This was completed and tried out



in the Head Office Demonstration Theatre in May and June 1970. The work was carried out under the direction of an outside consultant working with a small but experienced Rank Strand team headed by Ron Eason. During the summer of 1970, plans were discussed for the development